

**CALIFORNIA RESOURCES AGENCY  
COASTAL IMPACT ASSISTANCE PROGRAM  
PROJECT PROPOSAL FORM**

**Department:** Resources Agency  
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**Title of project:** California Ocean Resources Stewardship Implementation  
**Project location:** Entire California Coast  
**Total cost:** \$850,000  
**Funding request:** \$850,000

**MISSION**

*To ensure comprehensive and coordinated management, conservation and enhancement of California's ocean and coastal resources for their intrinsic value and for the benefit of current and future generations.*

**GOALS:** Four goals have been established by the State of California to achieve this mission.

**Goal 1: Stewardship.** To assess, conserve, and manage California's ocean and coastal resources and the ecosystem that supports those resources.

**Goal 2: Economic Sustainability.** To encourage environmentally sound, sustainable, and economically beneficial ocean and coastal resource development activities.

**Goal 3: Research, Education and Technology.** To advance research, educational programs, and technology developments to meet future needs and uses of coastal and ocean resources.

**Goal 4: Jurisdiction and Ownership.** To maximize California's interests in coastal watersheds, State Tidelands, the Territorial Sea, and the Exclusive Economic Zone.

## **Project Summary:**

**Background.** The Pacific Ocean off California provides substantial environmental, economic, aesthetic, recreational, educational, and scientific benefits to the people of California and the nation. Much of the quality of life and economic vibrancy supported by the state's ocean resources depends on successful management of those resources, and successful management depends on an adequate understanding of the natural, ecological, oceanographic, and coastal processes and their interactions with varied human activities. The state is working to maintain and increase the benefits of its ocean resources. In order to achieve these benefits California must apply sound management approaches based on a practical understanding of the state's ocean and coastal resources and issues impacting them.

The California Ocean Resources Stewardship Act (CORSAs) and the California Ocean Resources Management Act found that state and federal agencies often lack basic information for decision making. A major reason for this is that management issues are often broader than individual agency mandates and information is often dispersed throughout the system or simply does not exist. CORSAs requires the Secretary for Resources to report on actions taken by September 1, 2002 to ensure adequate coordination of science initiatives by ocean resource management agencies at the federal, state, and local level and with marine science institutions. The bill authorizes the Secretary to enter into an agreement with an existing nonprofit corporation to create the California Ocean Trust help achieve coordinated approaches to funding and implementing scientific research regarding California's ocean and coastal resources.

**Proposal: Establish and Fund the California Ocean Trust.** The Secretary for Resources proposes to establish the California Ocean Trust with \$900,000 for seed money for project funding. In addition, this proposal includes \$100,000 to support 50% of a Sea Grant Extension position for two years to provide technical support to the Trust. The California Sea Grant Program at the University of California will provide the remaining 50% funding for this position. This advisor will provide a critical role as a technical liaison between the members of the Trust and the research community.

CORSAs specifies that the purpose of the California Ocean Trust shall be all of the following:

- To seek funds for California ocean resource science projects, emphasizing the development of new funding sources.
- To fund California ocean resource science projects that help fulfill the missions of the state's ocean resource management agencies.
- To encourage coordinated, multi-agency, multi-institution, approaches to ocean resource science.
- To encourage graduate education programs in management-oriented ocean resource science in public and private universities and colleges in California.
- To encourage new technologies that reduce the cost, increase the amount, or improve the quality of ocean resource management information.
- To promote more effective coordination of California ocean resource science useful to management agencies.

The California Ocean Trust will be made up of 10 trustees. Eight trustees shall be appointed by the Secretary including: one member from the Resources Agency; three members jointly nominated by the University of California and the California State University; two public members who have experience as trustees or directors of for-profit or nonprofit corporations; and two members nominated by coast and ocean interest groups. The Secretary for Environmental Affairs shall nominate one trustee who shall have broad knowledge of water quality as it relates to the coast and ocean. The Director of Finance shall appoint one trustee, who shall serve at the pleasure of the director.

**Ocean Trust – Key Challenges.** Examples of existing challenges for ocean and coastal managers include depressed populations of many marine species, pollution that results in beach and fishery closures, dredging and dredge disposal needs of the ports, and coastal erosion that threatens structures and reduces the quality of beaches. Several state initiatives are currently underway to address these concerns. The California Ocean Trust can play a key role in helping to coordinate and fund scientific research aimed at assisting with management needs such as the ongoing management efforts listed below:

- **Marine Life Management Act:** Developing an ecologically sound approach to managing marine life including the state's commercial and recreational fisheries;
- **Marine Managed Areas Improvement Act:** Overhauling the state marine managed area classifications to create a more logical system;
- **Marine Life Protection Act.** Creating a master plan to improve California's system of marine life reserves;
- **Public Beach Restoration Act.** Studying erosion problems and funding projects to help protect California's beaches; and
- **California Polluted Runoff Control Plan.** Implementing California's federally approved plan to reduce polluted runoff.

## **Consistency with Mission and Goals**

**Mission:** The California Ocean Resources Stewardship Act (CORSAs) was written specifically to address the mission and goals established for the California Ocean Resources Management Program which form the basis for the Coastal Impact Assistance Program. In fact, the provisions of CORSAs were added to the Public Resources Code as a new chapter of the California Ocean Resources Management Act code provisions specifically for this purpose. The establishment of the California Ocean Trust will help ensure comprehensive and coordinated management, conservation and enhancement of California's ocean and coastal resources.

**Goal 1 Stewardship:** This proposal addresses stewardship of ocean and coastal resources by seeking to arm ocean and coastal managers with the scientific information that they need for effective management. This approach will help ensure the most effective and efficient approaches are used to develop the most valid scientific information for management purposes.

**Goal 2 Economic Sustainability:** The document California's Ocean Resources: An Agenda for the Future states that ocean dependent industries contributed \$17. billion to the state economy in 1992, creating over 370,000 jobs that year. That economy is largely based on the existence of clean coastal waters for swimming, healthy marine resources, sustainable fisheries, and the existence of beaches that are safe from erosion. This proposal requests a minimal amount of money to create a trust to help support the science necessary to manage this critical sector of California's economy. As the sixth largest economy in the world, California's management efforts have national implications for both the environment and the economy.

**Goal 3 Research, Education, and Technology Development:** The legislatively imposed purposes of CORSA specifically encourage the provision of sound scientific research, new graduate education programs aimed at ocean and coastal management, and new technologies that reduce the cost, increase the amount, or improve the quality of ocean resource management information. In fact, the goals of CORSA were patterned after the goals of the Ocean Resources Management Program which form the basis of the Coastal Impact Assistance Program.

**Goal 4 Jurisdiction and Ownership:** This proposal is intended to increase coordination between all agencies of jurisdiction in their pursuit of marine science for decision making. California's ocean ecosystem extends from the inland watershed zone, to the enclosed coastal waters zone (bays, estuaries, and coastal lagoons), the nearshore ocean zone, and the offshore ocean zone). It is clearly in the state and national interest to improve coordination between all levels of government, academia, the private sector, and the public that relate to the protection of watersheds, State Tidelands, the Territorial Sea, and the Exclusive Economic Zone.

#### **Project Budget:**

- |  |           |
|--|-----------|
| • Establish Initial Research Fund - California Ocean Trust | \$750,000 |
| • Sea Grant Advisor – 50% funding for two years            | \$100,000 |

#### **Project Timeline:**

The Resources Agency, the California Environmental Protection Agency, the Department of Finance, and the California Sea Grant Program will work together on the appointment process for trustees, the selection process for the Sea Grant Extension Agent for technical support, and the preparation of draft funding criteria and procedures for the California Ocean Trust. This timeline assumes that the first meeting of the trust will take place in January of 2002.

#### Appointment Process

- |                                    |               |
|------------------------------------|---------------|
| • Solicit nominations for trustees | August 2001   |
| • Nominations due                  | October 2001  |
| • Appointments made                | December 2001 |

#### Sea Grant Extension Agent Appointment

- Issue position availability and work statement August 2001
- Application deadline October 2001
- Interviews November 2001
- Hire new position December 2001

#### Develop Draft Funding Criteria and Procedures

- Begin funding criteria and Trust procedures August 2001
- Solicit comments on draft materials October 2001
- Complete final draft for review of trustees November 2001

#### Establish California Ocean Trust

- Hold first meeting of California Ocean Trust January 2002

**CALIFORNIA RESOURCES AGENCY  
COASTAL IMPACT ASSISTANCE PROGRAM  
PROJECT PROPOSAL FORM**

**Department:** San Francisco Bay Conservation and Development Commission,  
San Francisco Bay National Estuarine Research Reserve (NERR)

**Prepared by:** Todd E. Hopkins

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**Title of project:** San Francisco Bay NERR Headquarters Bay Water Delivery System

**Project location:** Marin County

**Total cost:** \$335,000

**Funding request:** \$100,000

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## **Project Summary:**

We propose to construct an energy-efficient bay water delivery system to provide the NERR and SF State University – Romberg Tiburon Center facilities with a constant and controllable source of bay water to be used for animal care, aquaculture, educational displays, wet-classroom, and experimental purposes. This system will be configured to allow future modification for bay water to circulate throughout the entire building providing an alternate form of energy efficient heating and cooling (HVAC) and fire suppression for the facility (*Note: the HVAC and fire suppression engineering/installation option is not part of this request as it requires an additional \$158K*). The proposed bay water delivery system will allow control of the salinity, temperature, turbidity, and flows, enabling replication of actual conditions found in various SF Bay environments. Awards from the National Science Foundation and SF State University have provided the bay intake and piping to bring bay water to the building. Funds from the National Institute of Health have been awarded for outfitting the aquaculture lab in our Research Laboratory. We are requesting funds for the portion of this system that will connect the intake line with our laboratory facility. To complete this bay water delivery system, we are require \$100,000 for the pumps, piping, filtration system, and the associated engineering and construction costs necessary for installation. Permits from federal, state and local agencies for the 300 ft intake line in the bay are already in place. The design specifications for the intake have also been approved by federal and state agencies.

## **Project Description:**

The Romberg Tiburon Center (RTC) is a marine laboratory operated by San Francisco State University (SFSU), a minority serving institution providing undergraduate and graduate (MA) degrees. RTC is also the headquarters for the proposed San Francisco Bay National Estuarine Research Reserve. RTC is located 30 minutes north of San Francisco on the Tiburon Peninsula and is the only academic research facility situated on San Francisco Bay. RTC's mission is to perform basic scientific research and to educate and train the next generation of scientists. RTC provides its students with graduate (MA) and undergraduate level courses as well as practical experience gained through research conducted in the laboratories of RTC scientists.

The outdoor portion of this project starts with an intake structure and intake line that will extend 300 ft into San Francisco Bay (already funded, see budget detail). A 200 GPM pump situated in a bayside pump-house will deliver water to land. Once ashore the water can be routed to many locations. One line will carry ambient bay water to our waterfront aquaculture facility and a second line takes water to one of four 5,000-gallon reservoir tanks behind the research laboratory. A third line will carry bay water to a filtration system for clarification. Filtered water will then be pumped to the second of the four reservoir tanks. The third and fourth reservoir tanks will hold freshwater and seawater, respectively. Water from the holding tanks can then be precisely mixed to provide experimental and holding conditions over a broad range of naturally occurring salinities. In this manner the full range of ambient estuarine conditions can be recreated. Water will be delivered in two ways to create a range of experimental environments: 1) gravity fed for on-demand ambient water, and 2) re-circulated water will be pumped in temperature controlled systems allowing the maintenance of heated and chilled

water. In addition to these holding tanks, we propose to place two 1,000 gallon tanks and four 100 gallon tanks in our aquaculture facility for use in experimental work with large invertebrates, fishes, and plankton communities. Four water tables will also be placed in the outdoor unit for incubating phytoplankton samples and to hold smaller aquaria for experiments, culture of small species, and display.

The indoor unit will consist of eight, 250-gallon tanks and four water tables to hold small aquaria for experiments, aquaculture studies and holding/display. These tanks and tables will be placed in the existing 700 ft<sup>2</sup> animal care and experimental aquaculture laboratory. The salinity, temperature, turbidity and flow rate of the water entering these tanks and water tables will be controlled by a system of computers, controllers, and software funded from other sources (see budget detail).

Temperature control will be achieved through active chilling and cogeneration. Utilizing SF Bay water to cool a cold water chiller (20 tons chilling/min) provides a source of energy efficient heated water for environmental control in the sea water system in the following way: 1) the water being discharged from the outdoor and indoor laboratories flows through a cistern that feeds two titanium plates and 2) frame heat exchangers and pumps creating pressurized loops servicing water source heat pumps. If modified in the future, these heat pumps can also provide heat to laboratory and office areas. The water leaving the cistern is cooled as a result of the heat pumped back to the laboratories and thus the cistern water is chilled for another source of energy efficient chilling. The cistern water thus chilled can be used for cold water environments or to mix with warmer water to create a range of temperatures. This combination of heating and cooling systems is the most efficient way to provide a range of aquatic environmental conditions. RTC's location in a cool climate adjacent to ambient water with ideal heat recapture properties provides options for research while concurrently reducing the expense of processing a significant volume of water. The system we propose for \$100K creates the base for a future "green" HVAC *which requires an additional \$158K to complete*. The "green" design of this cogeneration system is beneficial to RTC's budget and instills appropriate values to students in the environmental sciences.

### **Consistency with Mission and Goals:**

This proposal directly addresses issues listed in **Goal 2: Economic Sustainability and in Goal 3: Research, Education & Technology**. The proposed bay water delivery system, will provide a controlled source of salinated water for animal care, research and teaching laboratories, aquaculture facilities, and aquatic displays (SF State University is a minority serving institution). The technological and energy-saving innovations (HVAC/fire suppression) which will be built into this system (but not funded by this request) are examples of environmentally sound and sustainable engineering. Lastly, this proposal is consistent with the Coastal Zone Management Act and supports the mission of the proposed San Francisco Bay National Estuarine Research Reserve as described in the Authorized Use of Funds, Jan 23, 2001, (Section IV: 1A, 1E & 1J).



## Budget and Funding Sources:

	Funding Source and Amounts (in thousands)				
Item	CIAP	NSF	NIH	SFSU*	RTC*
<b>Intake System</b>					
Intake line from bay		99.0		9.0	
Fish screens				4.0	
<b>Delivery System</b>					
Pumps	8.0				
Chillers					22.0
Filtration system	20.0				
Piping	10.0				
Cistern				9.0	
Holding & Aquaculture tanks	32.0				
Electrical service	10.0				
Pump-house	10.0				
Design costs				3.0	
Construction costs	10.0				10.0
<b>Culture Laboratory</b>					
Experimental tanks and wet tables			15.0		
Controllers					45.0
Software			10.0		
Computer (controller server)			4.0		
Heat Exchanger					5.0
<b>Total by Source:</b>	<b>100.0</b>	<b>99.0</b>	<b>29.0</b>	<b>25.0</b>	<b>82.0</b>
<b>Total:</b>	<b>335.0</b>				
* SFSU and RTC have separate operational budgets					

**Cost Estimate for Requested CIAP Funds:**

<b>Item</b>	<b>CIAP Funds (in thousands)</b>
Pumps	8.0
Filtration system	20.0
Piping	10.0
Holding and aquaculture tanks	32.0
Electrical service	10.0
Pump-house	10.0
Construction costs	10.0
<b>Total CIAP Funds:</b>	<b>100.0</b>

**Timeline for Implementation:**

<b>Task</b>	<b>Timeframe (months)</b>
Delivery System (DS)/Design	O-II
DS/Pump, Filtration, Piping, Electrical Construction	I-IV
DS/Holding Tanks, Cistern, Chiller	II-IX
Culture Lab/Design	O-II
Culture Lab/Tank/Water Table Set-up	III-IX
Culture Lab/Controller, Software System Set-up	IV-IX